Pyokyeong Son — Economics Commentary (Commentary follows article)

President Trump Slaps Tariffs on Solar Panels in Major Blow to Renewable Energy

In the biggest blow he's dealt to the renewable energy industry yet, President Donald Trump decided on Monday to slap tariffs on imported solar panels.

The U.S. will impose duties of as much as 30 percent on solar equipment made abroad, a move that threatens to handicap a $28 billion industry that relies on parts made abroad for 80 percent of its supply. Just the mere threat of tariffs has shaken solar developers in recent months, with some hoarding panels and others stalling projects in anticipation of higher costs. The Solar Energy Industries Association has projected tens of thousands of job losses in a sector that employed 260,000.

The tariffs are just the latest action Trump has taken that undermine the economics of renewable energy. The administration has already decided to pull the U.S. out of the international Paris climate agreement, rolled back Obama-era regulations on power plant-emissions and passed sweeping tax reforms that constrained financing for solar and wind. The import taxes, however, will prove to be the most targeted strike on the industry yet.

"Developers may have to walk away from their projects," Hugh Bromley, a New York-based analyst at Bloomberg New Energy Finance, said in an interview before Trump's decision. "Some rooftop solar companies may have to pull out" of some states.

U.S. panel maker First Solar Inc. jumped 9 percent to $75.20 in after-hours trading in New York. The Tempe, Arizona-based manufacturer stands to gain as costs for competing, foreign panels rise. First Solar didn't immediately respond to a request for comment. The Solar Energy Industries Association also didn't immediately respond.

The first 2.5 gigawatts of imported solar cells will be exempt from the tariffs, Trump said in a statement Monday. The president approved four years of tariffs that start at 30 percent in the first year and gradually drop to 15 percent.

The duties are lower than the 35 percent rate the U.S. International Trade Commission recommended in October after finding that imported panels were harming American

manufacturers. The idea behind the tariffs is to raise the costs of cheap imports, particularly from Asia, and level the playing field for those who manufacture the parts domestically. For Trump, they may represent a step toward making good on a campaign promise to get tough on the country that produces the most panels — China. Trump's trade issues took a backseat in 2017 while the White House focused on tax reform, but it's now coming back into the fore: The solar dispute is among several potential trade decisions that also involve washing machines, consumer electronics and steel.

"It's the first opportunity the president has had to impose tariffs or any sort of trade restriction," Clark Packard, a trade policy expert at the R Street Institute in Washington, said ahead of the decision. "He's kind of pining for an opportunity."

Trump's solar decision comes almost nine months after Suniva Inc., a bankrupt U.S. module manufacturer with a Chinese majority owner, sought import duties on solar cells and panels. It asserted that it had suffered "serious injury" from a flood of cheap panels produced in Asia. A month later, the U.S. unit of German manufacturer SolarWorld AG signed on as a co-petitioner, adding heft to Suniva's cause.

An attorney for Solarworld didn't immediately respond to a request for comment.

Suniva had sought import duties of 32 cents a watt for solar panels produced outside the U.S. and a floor price of 74 cents a watt.

While Trump has broad authority on the size, scope and duration of duties, the dispute may shift to a different venue. China and neighbors including South Korea may opt to challenge the decision at the World Trade Organization — which has rebuffed prior U.S.-imposed tariffs that appeared before it.

Lewis Leibowitz, a Washington-based trade lawyer, expects the matter will wind up with the WTO. "Nothing is very likely to stop the relief in its tracks," he said before the decision. "It's going to take a while."

The solar industry may also attempt a long-shot appeal to Congress.

"Trump wants to show he's tough on trade, so whatever duties or quotas he imposes will stick, whatever individual senators or congressmen might say," Gary Hufbauer, a Washington-based senior fellow at the Peterson Institute for International Economics, said by email before the decision.

Pyokyeong Son

IB Economics HL

Ms. Susan Yamada

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An Economic Analysis of U.S.'s Tariffs on Solar Panels

In January of 2018, the United States implemented a tariff on imported solar panels.[1] In this essay, this situation will be economically analyzed as a situation of a positive externality of consumption, and the tariff will be modeled as an indirect ad valorem tax on foreign solar panels. It is assumed that firms always aim to maximize their economic profit, at where Marginal Cost (MC) = Marginal Revenue (MR)

I. Externalities and Taxes of Solar Panels
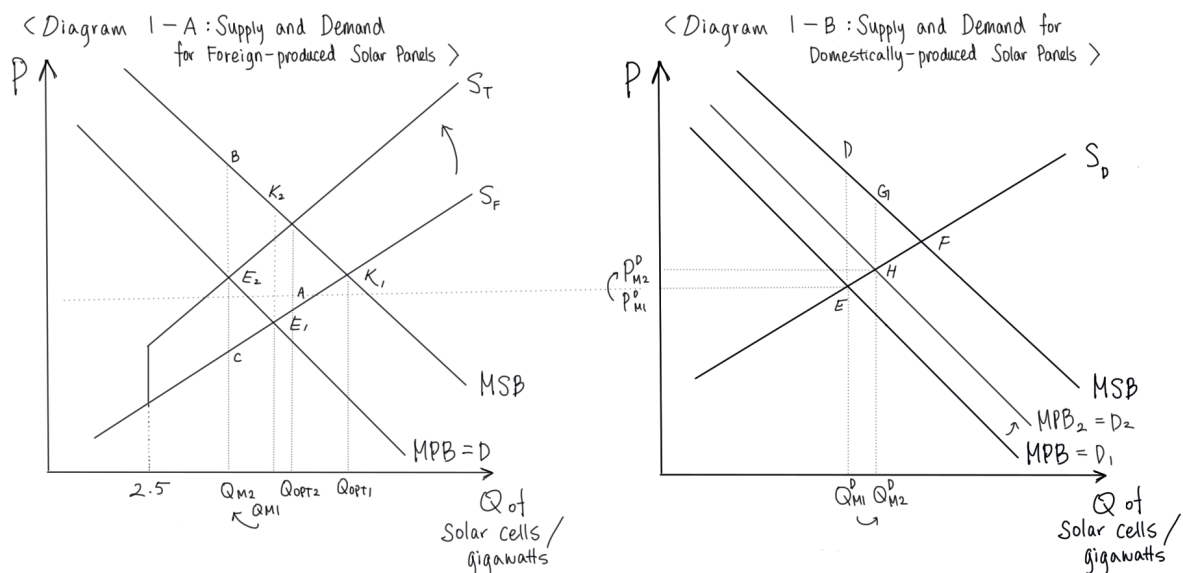
In Diagram 1-A, Marginal Social Benefit (MSB)—the marginal benefit to society—is higher than Marginal Private Benefit (MPB)—the marginal benefit to a consumer—, because it is environmentally beneficial to society to consume solar panels. The market's equilibrium is at E_1, and it will produce at Q_{M1}. However, the allocatively efficient point—the point where society is producing the right amount of good at the right price—is at Q_{OPT1}, and therefore, this market has failed; the welfare loss is $\triangle K_1 K_2 E_1$.

As the first 2.5 gigawatts of panels are exempted from the tariff, and is set at 30% above it, this tax will increase production costs for foreign firms and shift their supply curve to S_T. The new market equilibrium is at E_2, producing at Q_{M2}, while the optimum is at Q_{OPT2} —there is still market failure, and the welfare loss is $\triangle K_1 BC$.

As panels produced by domestic firms are substitutes to ones produced by foreign firms, the demand facing domestic firms will rise. In Diagram 1-B, this new demand curve is shown as MPB_2, and quantity produced will increase from Q_{M1}^D to Q_{M2}^D, and revenue will increase from $Q_{M1}^D \cdot P_{M1}^D$ to $Q_{M2}^D \cdot P_{M2}^D$. Conclusively, we can see that this tariff can indeed support domestic firms, reducing consumption of foreign panels and increasing the demand of domestic ones and therefore the revenue of domestic producers.

However, this does not necessarily mean that society is better off. In Diagram 1-A, welfare loss was initially $\triangle K_1 K_2 E_1$, but after the imposition of the tariff, it increased to $\triangle K_1 BC$. On the other hand, in Diagram 1-B, the welfare loss has decreased, from $\triangle DEF$ to $\triangle GHF$. We cannot be sure if the sum of these result in a welfare gain or loss, but can reasonably assume that the world market has a bigger scale, and therefore $\triangle K_1 BC \geq \triangle GHF$ and the whole society is likely worse off.

A difficulty with modeling a tariff as a tax on foreign goods, with two diagrams, is determining whether the whole society is better or worse off; the two diagrams may have different axis scales, and the area calculated as the welfare change may not be simply be summable. Therefore, a single-diagram analysis might have proven to be more effective.

II. Analysis of individual firms in the Perfectly Competitive Solar Panel Market
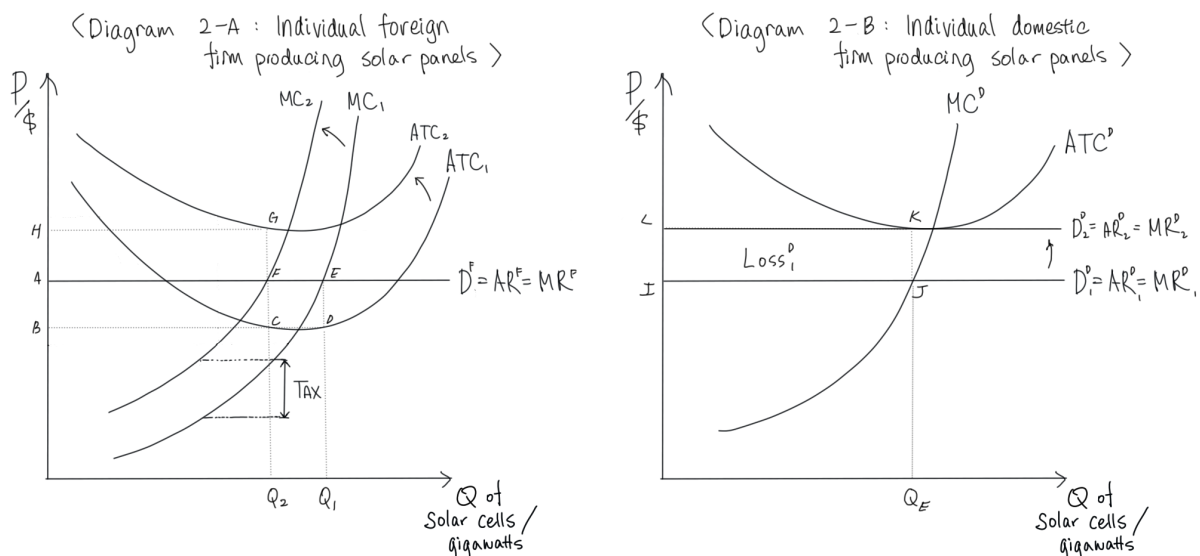
Diagrams 2-A and 2-B model a single foreign and domestic solar panel producing firm. The market is assumed to be perfectly competitive, as there are globally a huge number of firms each with small market share and power.[2]

Initially, the foreign firm produces relatively efficiently, with lower average total costs(ATC)—the total cost of producing one unit of a good—at ATC_1, and with MC_1, maximizing profit at Q_1, where $MC_1 = MR^F$, making profit of $\square ABDE$. The inefficient domestic firm produces at a higher ATC^D and MC^D, making a loss of $\square IJKL$.

As the tariff is introduced, the foreign firm will experience an increase to MC_2 and ATC_2. To minimize loss, the firm will produce less, at Q_2, with a loss of $\square AFGH$. On the other hand, since foreign-produced panels and domestically-produced panels are substitutes of each other, the domestic firm will experience an increase in demand, to D_2^D. They will produce at Q_E where $MC^D = MR_2^D$, and they will break even (or, if demand rises further, will make profit). Because some firms are making losses while other are making profit, there will be minimal entry and exit of firms even in the long run. The market has stabilized and will stay in this equilibrium.

Due to the tariff, domestic firms will clearly benefit. However, this is not necessarily beneficial to society, since it encourages inefficient behavior— domestic firms make more profit without any incentives to improve their efficiency (with, i.e., new technologies), while efficient, foreign firms are harmed.

It is also crucial to note that the effects of discouraging eco-friendly behavior has impacts not only on the local scale, but the economy as a whole—in the long term, it may cause climate change and pollution along with problems in the agricultural or health industry.

[1: Main Article] *Ekhouse, Brian."President Trump Slaps Tariffs on Solar Panels in Major Blow to Renewable Energy." Time. time.com/5113472/donald-trump-solar-panel-tariff/28. Jan 2018. Accessed 20 Feb 2018.*

[2] *"Renewables 2013 Global Status Report." REN21. http://www.ren21.net/Portals/0/ documents/Resources/GSR/2013/GSR2013_lowres.pdf. 2013. Accessed 21 Feb 2018.*

Word Count: 738 words
(Excludes Name, Class, Date, Diagram Titles and Labels, or Citations)